CLAIMS

What is claimed is:

1. A method for detecting presence of a valid signal, the method comprises:

initializing gain settings of a receiver section;

measuring received signal strength of a signal received by the receiver section to produce a first received signal strength indication (RSSI);

adjusting the gain setting of the receiver section such that the first RSSI is a predetermined offset less than a signal strength threshold;

measuring the received signal strength of a gain adjusted representation of the signal to produce a second RSSI;

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset;

continuing measuring the received signal strength of the gain adjusted representation of the signal and appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until a possible signal is detected; and

when the possible signal is detected, adjusting the gain settings of the receiver section based on dynamic range of the receiver section.

2. The method of claim 1 further comprises:

determining the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generating the second offset based on the difference value.

3. The method of claim 1 further comprises:

detecting the possible signal based on a correlation of the gain adjusted representation of the signal with a reference signal;

adjusting the gain setting of the receiver section to amplify the gain adjusted representation of the signal to produce an amplified signal; and

after a settling delay, determining whether the amplified signal corresponds to a valid signal.

4. The method of claim 1 further comprises:

detecting the possible signal when the second RSSI exceeds the signal strength threshold;

adjusting the gain settings of receiver section to a nominal setting;

after a settling delay, measuring signal strength of the signal received via the receive section with the gain settings at the nominal setting to produce a nominal setting RSSI value;

adjusting the gain settings of the receiver section to an optimal setting based on the nominal setting RSSI value; and

after a second settling delay, determining whether the amplified signal corresponds to a valid signal.

5. A method for detecting presence of a valid signal, the method comprises:

initializing gain settings of a receiver section;

measuring received signal strength of a signal received by the receiver section to produce a first received signal strength indication (RSSI);

adjusting the gain setting of the receiver section such that the first RSSI is a predetermined offset less than a signal strength threshold to produce a gain adjusted representation of the signal;

measuring the received signal strength of the gain adjusted representation of the signal to produce a second RSSI;

comparing the second RSSI with the signal strength threshold;

performing a correlation of the gain adjusted representation of the signal with a predetermined signal; and

when the comparing of the second RSSI with the signal strength threshold or the performing the correlation of the gain adjusted representation indicates detection of a possible signal, adjusting the gain settings of the receiver section based on dynamic range of the receiver section.

6. The method of claim 5, wherein the measuring the received signal strength of the gain adjusted representation of the signal further comprises:

measuring the received signal strength of a gain adjusted representation of the signal to produce the second RSSI;

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset; and

continuing measuring the received signal strength of the gain adjusted representation of the signal and appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until the possible signal is detected.

7. The method of claim 6 further comprises:

determining the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generating the second offset based on the difference value.

8. The method of claim 5 further comprises, when the performing the correlation of the gain adjusted representation indicates detection of the possible signal:

adjusting the gain setting of the receiver section to an optimal gain setting to amplify the gain adjusted representation of the signal to produce an amplified signal; and

after a settling delay, determining whether the amplified signal corresponds to a valid signal.

9. The method of claim 5 further comprises, when the comparing of the second RSSI with the signal strength threshold indicates detection of the possible signal:

adjusting the gain settings of receiver section to a nominal setting;

after a settling delay, measuring signal strength of the signal received via the receive section with the gain settings at the nominal setting to produce a nominal setting RSSI value;

adjusting the gain settings of the receiver section to an optimal setting based on the nominal setting RSSI value; and

after a second settling delay, determining whether the amplified signal corresponds to a valid signal.

10. A method for detecting presence of a valid signal, the method comprises:

determining a first received signal strength indication (RSSI) of an in-band spectrum of an incoming signal;

adjusting gain setting of a receiver section based on the first RSSI to pre-signal detect level to produce adjusted gain setting;

amplifying the incoming signal in accordance with the adjusted gain setting of the receiver section to produce an amplified incoming signal;

determining a second RSSI of a wide band spectrum of the amplified incoming signal;

comparing the second RSSI with the signal strength threshold;

performing a correlation of the gain adjusted representation of the signal with a predetermined signal; and

when the comparing of the second RSSI with the signal strength threshold or the performing the correlation of the gain adjusted representation indicates detection of a possible signal, adjusting the gain settings of the receiver section based on dynamic range of the receiver section.

11. The method of claim 11, wherein the determining the second RSSI further comprises:

determining whether the second RSSI value drifts from signal strength threshold less a predetermined offset;

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate

for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset; and

continuing measuring the received signal strength of the gain adjusted representation of the signal and appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until the possible signal is detected.

12. The method of claim 11 further comprises:

determining the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generating the second offset based on the difference value.

13. The method of claim 10 further comprises, when the performing the correlation of the gain adjusted representation indicates detection of the possible signal:

adjusting the gain setting of the receiver section to an optimal gain setting to amplify the gain adjusted representation of the signal to produce an amplified signal; and

after a settling delay, determining whether the amplified signal corresponds to a valid signal.

14. The method of claim 10 further comprises, when the comparing of the second RSSI with the signal strength threshold indicates detection of the possible signal:

adjusting the gain settings of receiver section to a nominal setting;

after a settling delay, measuring signal strength of the signal received via the receive section with the gain settings at the nominal setting to produce a nominal setting RSSI value;

adjusting the gain settings of the receiver section to an optimal setting based on the nominal setting RSSI value; and

after a second settling delay, determining whether the amplified signal corresponds to a valid signal.

15. A radio receiver comprises:

radio frequency (RF) front end operably coupled to convert an RF signal into a low intermediate frequency (IF) signal, wherein gain of the RF front end is established based on a front end gain setting control signal;

analog to digital converter operably coupled to convert the low IF signal into a digital low IF signal, wherein gain of the analog to digital converter is established based on an ADC gain setting control signal;

first power measurement module operably coupled to measure received signal strength of the digital low IF signal to produce a first RSSI value;

low pass filter operably coupled to filter the digital low IF signal to produce a digital filtered signal;

second power measurement module operably coupled to measure received signal strength of the digital filtered signal to produce a second RSSI value;

data detection module operable coupled to recapture data from the digital filtered signal when the digital filtered signal is a valid signal;

automatic gain control module operably coupled to generate the front end gain setting control signal and the ADC gain setting control signal by:

initializing the front end gain setting control signal and the ADC gain setting control signal;

adjusting the front end gain setting control signal and the ADC gain setting control signal such that the first RSSI is a predetermined offset less than a signal strength threshold;

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset;

continuing appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until a possible signal is detected; and

when the digital filtered signal is determined to be the valid signal, adjusting the gain settings of the receiver section based on dynamic range of the receiver section.

16. The radio receiver of claim 15, wherein the automatic gain control module further functions to:

determine the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generate the second offset based on the difference value.

17. The radio receiver of claim 15, wherein the automatic gain control module further functions to:

when the digital filtered signal is determined to possibly be valid based on a correlation of the digital filtered signal with a reference signal, adjust the front end gain control

signal and the ADC gain control signal to an optimal level to amplify the gain adjusted representation of the signal to produce an amplified signal.

18. The radio receiver of claim 15, wherein the automatic gain control module further functions to:

adjust the front end gain control signal and the ADC gain control signal to a nominal level when the digital filtered signal is determined to possibly be valid based on the second RSSI exceeding the signal strength threshold;

after a settling delay, retrieve an updated second RSSI value from the second power measure module;

adjust the front end gain control signal and the ADC gain control signal to an optimal level based on the updated second RSSI value.

19. A radio receiver comprises:

radio frequency (RF) front end operably coupled to convert an RF signal into a low intermediate frequency (IF) signal, wherein gain of the RF front end is established based on a front end gain setting control signal;

analog to digital converter operably coupled to convert the low IF signal into a digital low IF signal, wherein gain of the analog to digital converter is established based on an ADC gain setting control signal;

first power measurement module operably coupled to measure received signal strength of the digital low IF signal to produce a first RSSI value;

low pass filter operably coupled to filter the digital low IF signal to produce a digital filtered signal;

second power measurement module operably coupled to measure received signal strength of the digital filtered signal to produce a second RSSI value;

data detection module operable coupled to recapture data from the digital filtered signal when the digital filtered signal is a valid signal;

correlation module operably coupled to determine possible validity of the digital filtered signal;

automatic gain control module operably coupled to generate the front end gain setting control signal and the ADC gain setting control signal by:

setting the front end gain control signal and the ADC control signal to initial settings;

adjusting the front end gain control signal and the ADC control signal such that the first RSSI value is a predetermined offset less than a signal strength threshold to produce a gain adjusted representation of the signal;

measuring the received signal strength of the gain adjusted representation of the signal to produce a second RSSI value;

comparing the second RSSI value with the signal strength threshold;

performing a correlation of the gain adjusted representation of the signal with a predetermined signal; and

when the comparing of the second RSSI with the signal strength threshold or the correlation module indicates that the digital filtered signal is possibly valid, adjusting the gain settings of the receiver section based on dynamic range of the receiver section.

20. The radio receiver of claim 19, wherein the measuring the received signal strength of the gain adjusted representation of the signal further comprises:

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset; and

continuing appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until the possible signal is detected.

21. The radio receiver of claim 20, wherein the automatic gain control module further functions to:

determine the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generate the second offset based on the difference value.

22. The radio receiver of claim 19 further comprises, when the correlation module indicates the possibility that the digital filtered signal is the valid signal:

adjusting the front end gain control signal and the ADC gain control signal to an optimal gain setting.

23. The radio receiver of claim 19 further comprises, when the comparing of the second RSSI with the signal strength threshold indicates that the digital filtered signal is possibly a valid signal:

adjusting the front end gain control signal and the ADC gain control signal to a nominal setting;

after a settling delay, retrieving an updated second RSSI value from the second power measurement module; and

adjusting the front end gain control signal and the ADC gain control signal to an optimal setting based on the updated second RSSI value.

24. An apparatus for detecting presence of a valid signal, the apparatus comprises:

processing module; and

memory operably coupled to the processing module, wherein the memory includes operational instructions that cause the processing module to:

determine a first received signal strength indication (RSSI) of an in-band spectrum of an incoming signal;

adjust gain setting of a receiver section based on the first RSSI to pre-signal detect level to produce adjusted gain setting;

amplify the incoming signal in accordance with the adjusted gain setting of the receiver section to produce an amplified incoming signal;

determine a second RSSI of a wide band spectrum of the amplified incoming signal;

compare the second RSSI with the signal strength threshold;

perform a correlation of the gain adjusted representation of the signal with a predetermined signal; and

when the comparing of the second RSSI with the signal strength threshold or the performing the correlation of the gain adjusted representation indicates detection of a possible signal, adjust the gain settings of the receiver section based on dynamic range of the receiver section.

25. The apparatus of claim 24, wherein the memory further comprises operational instructions that cause the processing module to determine the second RSSI by:

determining whether the second RSSI value drifts from signal strength threshold less a predetermined offset;

when the second RSSI value drifts from the signal strength threshold less the predetermined offset, appending a second offset to the second RSSI value to compensate for the drifting of the second RSSI value to produce an adjusted second RSSI value such that the signal strength threshold less the adjusted second RSSI value substantially equals the predetermined offset; and

continuing measuring the received signal strength of the gain adjusted representation of the signal and appending an updated offset to the adjusted second RSSI value when the adjusted second RSSI value drifts from the signal strength threshold less the predetermined offset until the possible signal is detected.

26. The apparatus of claim 25, wherein the memory further comprises operational instructions that cause the processing module to:

determine the drift of the second RSSI value by determining a difference value based on a difference between the second RSSI value and the signal strength threshold; and

when the difference value is greater than a drift threshold, generate the second offset based on the difference value.

27. The apparatus of claim 24, wherein the memory further comprises operational instructions that cause the processing module to, when the performing the correlation of the gain adjusted representation indicates detection of the possible signal:

adjust the gain setting of the receiver section to an optimal gain setting to amplify the gain adjusted representation of the signal to produce an amplified signal; and

after a settling delay, determine whether the amplified signal corresponds to a valid signal.

28. The apparatus of claim 24, wherein the memory further comprises operational instructions that cause the processing module to, when the comparing of the second RSSI with the signal strength threshold indicates detection of the possible signal:

adjust the gain settings of receiver section to a nominal setting;

after a settling delay, measure signal strength of the signal received via the receive section with the gain settings at the nominal setting to produce a nominal setting RSSI value;

adjust the gain settings of the receiver section to an optimal setting based on the nominal setting RSSI value; and

after a second settling delay, determine whether the amplified signal corresponds to a valid signal.